

Amendments to the Claims

The following listing of claims replaces all previous listings and versions of claims in this application.

Claims 1. to 5. (Cancelled)

6. (Currently Amended) A field emission backplate comprising a plurality of emitter sites formed by laser crystallisation of a planar body or thin film of amorphous semiconductor based material.

7. (Currently Amended) The method field emission backplate of claim 6, wherein the semiconductor based material is silicon or an allow thereof.

8. (Previously Presented) A field emission device comprising the field emission backplate of claim 6.

9. (Currently Amended) The field emission device of claim 8, wherein the field emission device is a vacuum device, wherein the emitter sites of the backplate act as an emission source in the device.

10. (Currently Amended) The field emission device of claim 9, further comprising a substrate, a field emission backplate, and an evacuated space and a transparent window, wherein the field emission backplate is formed upon the substrate and the evacuated space is located between the field emission backplate and the thin film transparent window metal or metallised phosphor.

11. (Currently Amended) The field emission device of claim 8, further comprising a wide band-gap light emitting material, into which the electrons from the emitter sites of the backplate are emitted in use.

12. (Currently Amended) The field emission device of claim 11, further comprising a substrate, a the field emission backplate on one side of which is formed a the plurality of emitter sites, a the wide band-gap light emitting material comprising a light emitting polymer, and a transparent window comprising a metal or metallised phosphor, wherein a the field emission backplate is formed upon the substrate, and one surface of the light emitting polymer is disposed on a the plurality of emitter sites of the field emission backplate, the thin film transparent metal window being disposed on the other another surface of the light emitting polymer.

13. (Currently Amended) The field emission device of claim 118, wherein the device is a display device.

Claims 14. to 38. (Cancelled)

39. (New) A method of forming the field emission backplate of claim 6 comprising:
providing a planar body of amorphous semiconductor based material upon a substrate;
and
laser crystallising at least a portion of the amorphous semiconductor based material;
wherein upon crystallising the amorphous semiconductor based material a plurality of emitter sites are formed.

40. (New) The method of claim 39, wherein the planar body of amorphous semiconductor based material is provided by depositing a thin film of material upon the substrate.

41. (New) The method of claim 39, wherein the semiconductor based material is silicon or an allow thereof.

42. (New) The method of claim 39, further comprising the step of performing laser crystallising using an excimer or Nd:YAG laser.

43. (New) The method of claim 42, wherein the excimer laser is a KrF laser.
44. (New) A field emission backplate comprising a planar backplate member substantially comprising an amorphous semiconductor based material, and a plurality of grown tips substantially comprising a crystalline semiconductor based material formed by laser crystallisation on the backplate member.
45. (New) The field emission backplate of claim 44, wherein the substantially planar backplate comprises a thin film of amorphous semiconductor based material.
46. (New) The field emission backplate of claim 44, wherein the amorphous semiconductor based material is silicon or an alloy thereof.
47. (New) The field emission backplate of claim 44, wherein the plurality of tips are grown in a manner resulting in each having a sharp, pointed shape.
48. (New) The field emission backplate of claim 44, wherein the plurality of tips are grown and etched simultaneously.
49. (New) The field emission backplate of claim 44, wherein the crystalline semiconductor based material is a silicon.
50. (New) The field emission backplate of claim 44, wherein each of the tips is formed on a respective crystallised area of the planar member.
51. (New) A field emission device comprising the field emission backplate according to claim 44.
52. (New) The field emission device of claim 51, wherein the plurality of grown tips comprise an array of profiled tips formed by the selective growth of crystalline

semiconductor based material on a plurality of crystallised areas of the substantially planar backplate comprising a thin film of amorphous semiconductor based material.

53. (New) The field emission device of claim 52, wherein the device is a vacuum device, and wherein tips act as an emission source in the device, in use.

54. (New) The field emission device of claim 51, further comprising a substrate, an evacuated space and a transparent window, wherein the field emission backplate is formed upon the substrate and the evacuated space is located between the field emitting backplate and the transparent window.

55. (New) The field emission device of claim 52, further comprising a wide band-gap light emitting material into which electrons from the tips are emitted.

56. (New) The field emission device of claim 55, further comprising a substrate, the wide band-gap light emitting material, and a transparent window, wherein electrons from the tips are emitted into the wide band-gap light emitting material.

57. (New) The field emission device of claim 56, wherein the wide bank-gap light emitting material is a light emitting polymer.

58. (New) The field emission device of claim 56, wherein the transparent window is a thin film transparent metal.

59. (New) The field emission device of claim 56, wherein one surface of the light emitting material is disposed on the plurality of tips of the field emission backplate and the transparent window is disposed on another surface of the light emitting material.

60. (New) The field emission device of claim 52, wherein the device is a display device.

61. (New) The field emission device of claim 52, wherein the tips of the field emission backplate are of a density of at least 100 per square micron.

62. (New) A method of forming a field emission backplate according to claim 44, the method comprising:

depositing a thin film of amorphous semiconductor based material upon a substrate;
locally laser crystallising a plurality of areas of the thin film amorphous semiconductor based material; and

growing crystalline semiconductor based material upon each of the plurality of crystallised areas of thin film amorphous semiconductor based material.

63. (New) The method of claim 62, further comprising the steps of depositing the thin film of amorphous semiconductor based material by plasma enhanced chemical vapour deposition.

64. (New) The method of claim 62, further comprising the steps of crystallising the plurality of areas of thin film amorphous semiconductor based material by exposure to at least one pulse laser interference pattern.

65. (New) A method of crystallising areas of thin film amorphous semiconductor based material for use in the field emission backplate of claim 44, the method comprising:

forming a laser interferometer by splitting and recombining a laser beam;
placing a thin film of amorphous semiconductor based material in the plane of the recombination of the laser beam;

locally crystallising areas of the thin film of amorphous semiconductor based material by subjecting the thin film to at least one laser pulse wherein the crystallised areas generated in the thin film amorphous semiconductor based material correspond to the interference pattern of the laser.

66. (New) The method of claim 65, wherein for a backplate of amorphous semiconductor based material, wherein the semiconductor based material is hydrogenated amorphous silicon, the laser operates at a wavelength of around 532 nm to maximise absorption.

67. (New) The method of claim 65, wherein the laser is a Nd:YAG laser.